Space Weather Forecast

Issued on Saturday, 16 April 2022 at 01:26 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Slight chance of further G1/Minor geomagnetic storms on days 1 to 3 (16th-18th) due to coronal hole high speed stream affects. Chance of further R1 radio blackouts from M class flares. Increasing but still slight chance of R3 radio blackouts from X class flares.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Moderate with a long duration Moderate flare. There are signs of increasing activity as potential regions from the far side approach and this appears to be the source. There are three sunspots on the disc, and these are all currently small with little activity observed. No Earth-directed coronal mass ejections (CMEs) have been observed.

Solar Wind / Geomagnetic Activity: The solar wind was slightly elevated increasing to elevated following the arrival of a fast wind from a coronal hole. The magnetic field carried by the wind was Strong at first but did return to weak levels through the day. The important north-south component was in the negative (southward) direction at first, this resulted in a Minor Storm interval between 15/0000-0300 UTC. After which mainly Unsettled to Active activity was observed.
Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) was at background with no solar radiation storms observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is expected to be Low to Moderate. The three sunspot regions on the disc are small, and only showing limited growth, however activity from the far-side is increasingly likely to affect the Earth as it rotates near to and onto the near-side through the period. There is a chance of further Moderate flares as the more active regions on the far side approach the eastern limb and a slight chance of X flares, especially later.

Solar Wind / Geomagnetic Activity: Earth is currently exiting the CME magnetic cloud which left the Sun on the 11th. However, the fast wind from a coronal hole has arrived. Various coronal hole features may affect Earth from days 1-3 (16th-18th), although this carries low confidence. No further CME arrivals are anticipated. Geomagnetic activity is forecast to be mostly Unsettled to Active with a slight chance of Minor Storms until day 3 (18th). Later on day 3 into day 4 (18th-19th) a return to mainly Quiet conditions is likely.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is forecast to remain at background with no solar radiation storms occurring.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	Yes	20	20	20	5
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	50	50	50	50
Very Active	R3 to R5 X	No	2	5	10	10

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	1	1	1	1
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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